CLAIMS

1. A vinyl polymer which has at least one terminal functional group per molecule and has a ratio of weight average molecular weight to number average molecular weight of less than 1.8 as determined by gel permeation chromatography,

said terminal functional group being a crosslinking silyl group of the general formula (1) shown below, an alkenyl group of the general formula (2) shown below, or a hydroxyl group.

$$-[Si(R^1)_{2-b}(Y)_bO]_m-Si(R^2)_{3-a}(Y)_a \quad (1)$$

wherein $R^1$ and $R^2$ each independently represents an alkyl group containing 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms, or a triorganosiloxy group of the formula $(R')_3SiO-$ (R' being a monovalent hydrocarbon residue containing 1 to 20 carbon atoms and the three R' groups being the same or different), provided that when a plurality of $R^1$ or $R^2$ groups occur, they may be the same or different; Y represents a hydroxyl group or a hydrolyzable group, provided that when a plurality of Y groups occur, they may be the same or different; a represents 0, 1, 2 or 3, b represents 0, 1 or 2, and m represents an integer of 0 to 19, provided that the condition $a + mb \geqq 1$ should be satisfied;

$$H_2C=C(R^3)- \quad (2)$$

wherein $R^3$ represents a hydrogen atom or a methyl group.

2. The vinyl polymer according to Claim 1, wherein the ratio of weight average molecular weight to number average molecular weight as determined by gel permeation chromatography is not more than 1.7.

3. The vinyl polymer according to Claim 1, wherein

the ratio of weight average molecular weight to number average molecular weight as determined by gel permeation chromatography is not more than 1.6.

4. The vinyl polymer according to Claim 1, wherein the ratio of weight average molecular weight to number average molecular weight as determined by gel permeation chromatography is not more than 1.5.

5. The polymer according to Claim 1, wherein its main chain is a (meth)acrylic polymer.

6. The polymer according to Claim 5, wherein the main chain is an acrylate ester polymer.

7. The polymer according to Claim 1, wherein the main chain is produced by atom transfer radical polymerization.

8. The polymer according to Claim 1 as produced by converting a terminal halogen group of the halogen-terminated vinyl polymer to a crosslinking silyl-containing substituent, an alkenyl-containing substituent, or a hydroxyl-containing substituent.

9. The crosslinking silyl-terminated vinyl polymer according to Claim 1, wherein Y in general formula (1) is a hydrogen atom, a halogen atom, a hydroxyl, alkoxyl, acyloxyl, ketoximate, amino, amido, aminoxyl, mercapto or alkenyloxyl group, provided that when a plurality of Y groups occur, they may be the same or different with each other.

10. The vinyl polymer according to Claim 9, wherein Y in general formula (1) is an alkoxyl group.

11. The alkenyl-terminated vinyl polymer according

to 1, wherein the alkenyl group is represented by one of the general formulas (3) to (7) shown below.

$H_2C=C(R^4)-R^5-$ (3)

$H_2C=C(R^4)-R^5-O-$ (4)

$H_2C=C(R^4)-R^5-OC(O)-$ (5)

$H_2C=C(R^4)-R^5-C(O)O-$ (6)

$H_2C=C(R^4)-R^5-OC(O)O-$ (7)

wherein $R^4$ represents a hydrogen atom or a methyl group and $R^5$ represents a direct bond, or an alkylene group containing 1 to 20 carbon atoms, an arylene group containing 6 to 20 carbon atoms or an aralkylene group containing 7 to 20 carbon atoms, which may contain one or more ether bonds.

12. The polymer according to Claim 1, wherein its main chain has at least one hydroxyl group bonded thereto in a form represented by one of the general formulas (8) to (12).

$HO-R^6-$ (8)

$HO-R^7-O-$ (9)

$HO-R^7-OC(O)-$ (10)

$HO-R^7-C(O)O-$ (11)

$HO-R^7-OC(O)O-$ (12)

wherein $R^6$ represents a direct bond, or an alkylene group containing 1 to 20 carbon atoms, an arylene group containing 6 to 20 carbon atoms or an aralkylene group containing 7 to 20 carbon atoms, which may contain one or more ether bonds; and $R^7$ represents an alkylene group containing 1 to 20 carbon atoms, an arylene group containing 6 to 20 carbon atoms or an aralkylene group containing 7 to 20 carbon atoms, and may contain one or more ether bonds.